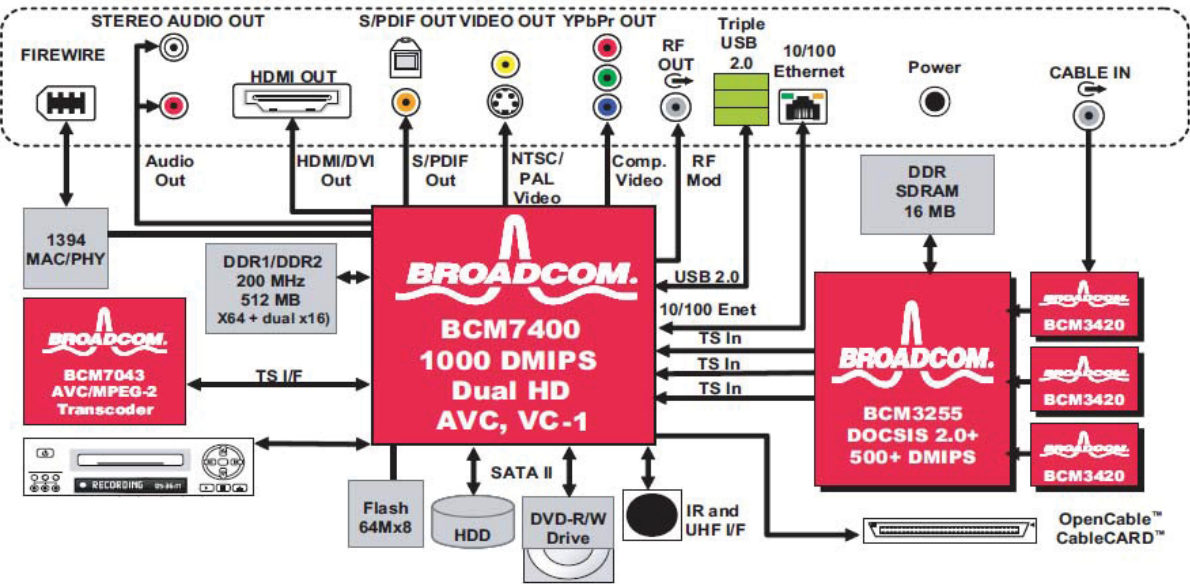


# **Exhibit E**

**EXHIBIT A**  
**Preliminary Infringement Claim Chart for U.S. Pat. No. 6,233,389**  
**Samsung DVRs**

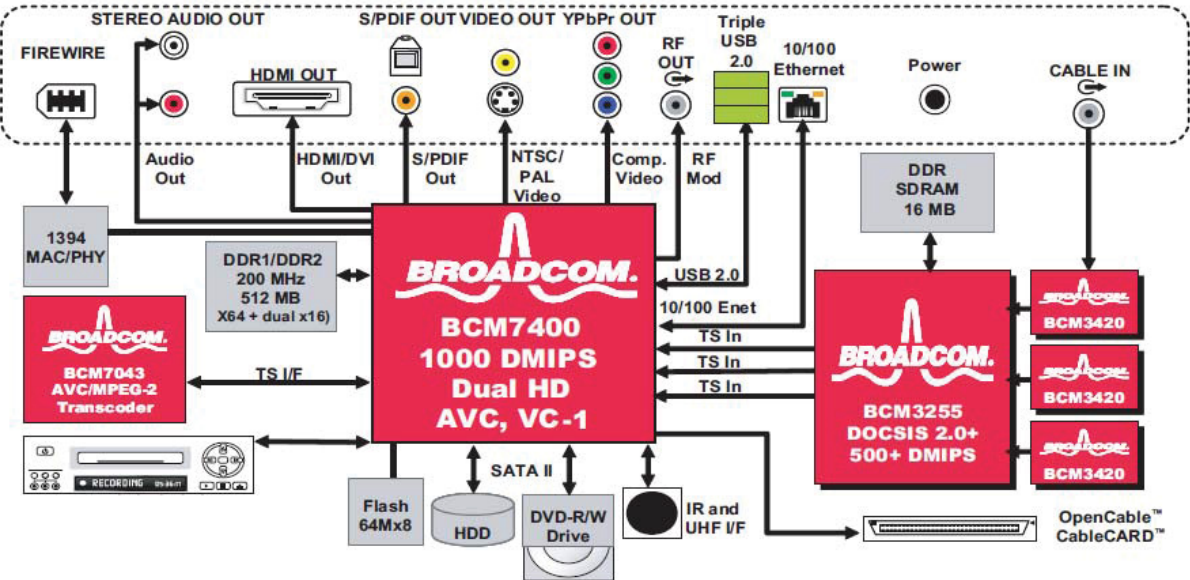
the Claim	Samsung DVRs <sup>1</sup>
<b>Claim 1</b>	
<p>1[a]. A process for the simultaneous storage and play back of multimedia data, comprising the steps of:</p>	<p>A Samsung DVR can simultaneously store and play back multimedia data. <i>See, e.g.,</i> <a href="http://www.timewarnercable.com/MediaLibrary/1/1/FAQ/Digital%20Cable/Samsung/Samsung_SMT_3090HD_UserGuide.pdf">http://www.timewarnercable.com/MediaLibrary/1/1/FAQ/Digital%20Cable/Samsung/Samsung_SMT_3090HD_UserGuide.pdf</a> (Samsung SMT-H3090 2008 User Guide), p. 2 ("Viewing one program while recording another program." "Simultaneous Time Shifted Buffering for two Programs."); p. 9 ("Record two live TV programs simultaneously while watching two recorded programs on HDD.")</p> <p><b>"TIME WARNER CABLE AND SAMSUNG FORGE AGREEMENT FOR TRU2WAY SET-TOP DEVELOPMENT, PURCHASE &amp; DEPLOYMENT</b>  <b>Release Date: 07/06/2009</b></p> <p>Time Warner Cable and Samsung today announced that they have signed a letter of commitment for the continued development, purchase and deployment of Samsung True2Way enabled set-top boxes, including the first second-source DVR.</p> <p>"We look to offer our customers advanced set-top boxes with features that are simple and easy to use," said Mike Hayashi, Executive Vice President of Advanced Engineering for Time Warner Cable. "We have been a leader in the roll-out of Tru2Way devices and we are continuing to grow our relationship with Samsung, a CE company dedicated to the development of new equipment meeting the necessary standards and offering attractive feature sets."</p> <p>Thomas Rhee, SVP, New Business Development for Samsung, added, "We are thrilled to have worked closely with Time Warner Cable to launch Tru2way on our family of cable set-tops including the SMT-H3090 and SMT-H3270 High Definition DVRs. As in Korea, we look forward to the expansion of Tru2way in North America."</p> <p>This agreement further solidifies Time Warner Cable's commitment to its deployment of Tru2Way enabled set-top boxes. To date Time Warner Cable has deployed over 2 million Tru2Way set-top boxes, of which approximately 400,000 are Samsung boxes.</p> <p>Time Warner Cable and Samsung also recently signed an MOU that focuses on collaborating in development of better home</p>

<sup>1</sup> In this chart, reference is made to a Samsung DVR identified as SMT-H3090. The same analysis applies to other Samsung DVRs with the same functionality, including but not limited to set top boxes with DVR functionality bearing the model designations, SMT-H3272, SMTH3270, and SMT-H4372 and other DVRs having the same functionality. Additionally, this chart also references the specific processor included in the SMT-H3090. The same analysis applies to DVRs that include other processors with the same functionality, for example the processors in each of the accused DVRs.

the Claim	Samsung DVRs <sup>1</sup>
	 <p>To the extent any differences are alleged to exist between this claim element and the above referenced functionality, such differences are insubstantial. On information and belief, the hardware and software in the Samsung DVRs perform substantially the same function as the physical data source, for example that accepting, parsing, and temporarily storing, in substantially the same way, for example by receiving data that has been transmitted to the DVR, PID filtering, startcode detecting and otherwise analyzing that data, and writing that data to memory locations and disks, to yield the same result, a properly formatted data stream for further processing by the rest of the system.</p>
[31c] providing a source object, wherein said source object extracts video and audio data from said physical data source;	<p>A Samsung DVR provides a source object, a collection of data and operations that, among other things, extracts video and audio data from the physical data source. For example, in a Samsung DVR, video and audio data move from the Broadcom BCM3255 chip, or similar chip, to memory, including DRAM and/or the Data Transport processor of the Broadcom 7400 chip, or similar chip, and from the BCM7400 chip, or similar chip, to memory, including DRAM. <i>See, e.g.,</i> (BCM7400 Product Brief) (showing Transport Input data going into MPEG-2/DVB Transport of the Broadcom BCM7400 chip:</p>

the Claim	Samsung DVRs <sup>1</sup>
	<div data-bbox="373 228 1585 893"><p>The diagram illustrates the internal architecture of the BCM7400 chip. At the top, it shows connections for PCI 2.2 &amp; Flash, Dual SATA2, 64-bit DDR2-SDRAM, USB 2.0 x2, and another USB 2.0. The central processing area includes a Dual-Threaded MIPS® µP (32 KB I, 16 KB I, 16 KB D, 128 KB L2 FPU and MMU), a Secure Processor with ROM and OTP, a Bus Bridge, a DRAM Controller, a DMA, and a Video block containing scalers, compositors, digital noise reduction, deinterlacing, and picture-in-picture. It also features an Advanced 2D Graphics Display Engine, a 3D Graphics Rendering Engine, and Dual Multiformat Audio Processors. On the left, inputs include Dual ITU-R-656 I'S In x2, DCAS, SCARD, MCARD, and Transport Input x6. On the right, outputs include IR In x2, UHF In x2, IR Out, Triple UARTs, GPIO, L x2, R x2, SPDIF, I'S Out x2, HD/SD Video, SD Video, ITU-R-656/TTX, HDMI, and NTSC Channel 3/4. At the bottom, it shows ISO7816 I/F x3, RMX x2, Dual 16-bit DDR2 Pixel Op Ports, Gateway Services, BSC x5, and an RF Modulator. Other internal blocks include ITU-R-656 Decoders, MPEG-2/DVB Transport, Dual PVR Engine with Trick Modes, Dual High-Definition AVC/MPEG-2/VC-1 Video Decoders, and a Soft Modem (Si305X, Ethernet 10/100BASE-T).</p></div> <p style="text-align: center;"><b>BCM7400 Block Diagram</b></p> <p>(BCM7400 Product Brief) (showing data moving out of BCM3255 to BCM7400, and showing data moving to and from the 512 MB 64-bit DDR RAM and the BCM7400 chip):</p>



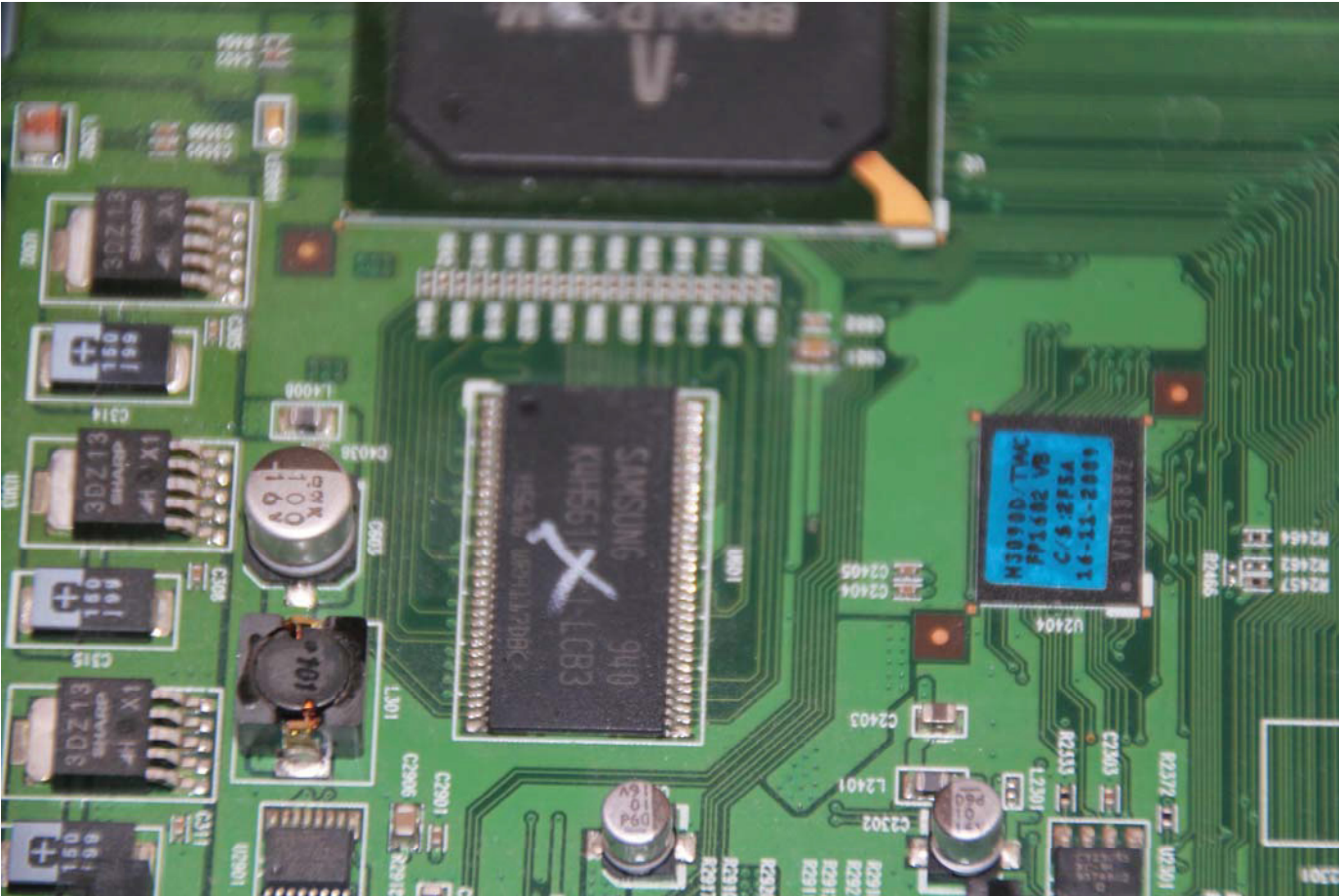
the Claim	Samsung DVRs <sup>1</sup>
	<p>(Samsung SMT-H3090 2008 User Guide), p. 10 ("User can pause live TV program for a certain amount of time, and resume it to watch. The STB allows 90 minutes of recording for Time-shift recording."); p. 10 ("Record two live TV programs simultaneously while watching two recorded programs on HDD.")</p> <p>Samsung DVRs store data streams on and retrieve data streams from a hard disk drive (HDD) during recording and playback, respectively. <i>See, e.g.</i>, (BCM7400 Product Brief) (showing SATA II interface to HDD):</p>  <p><a href="http://www.timewarnercable.com/MediaLibrary/1/1/FAQ/Digital%20Cable/Samsung/Samsung_SMT_3090HD_UserGuide.pdf">http://www.timewarnercable.com/MediaLibrary/1/1/FAQ/Digital%20Cable/Samsung/Samsung_SMT_3090HD_UserGuide.pdf</a> (Samsung SMT-H3090 2008 User Guide), at 6:</p>

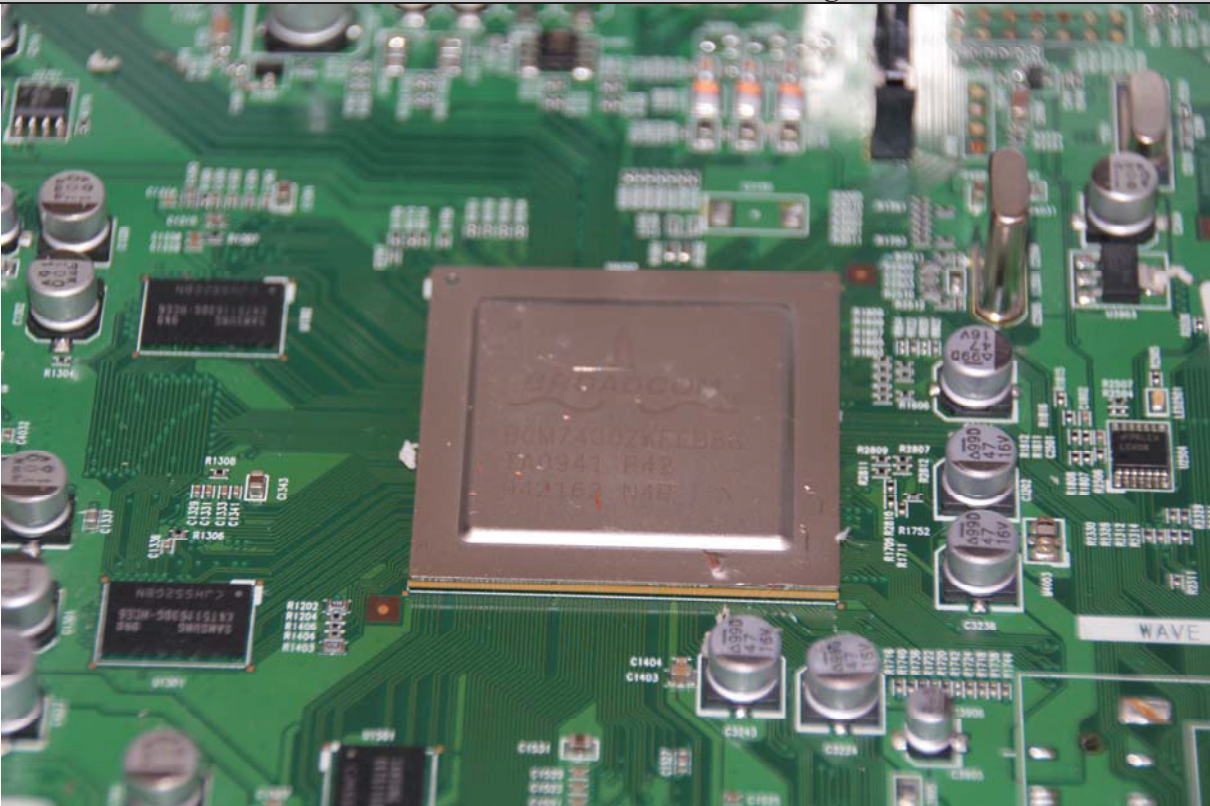


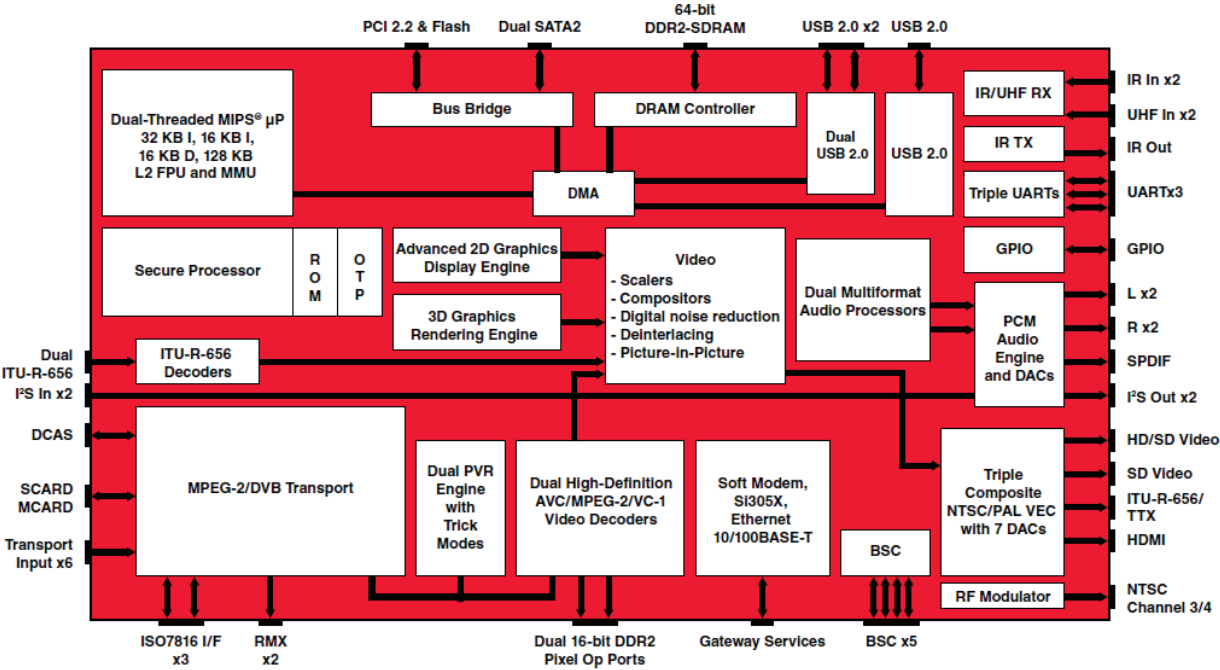
the Claim	Samsung DVRs <sup>1</sup>						
	<p><b>Digital HD DVR STB (SMT-H3090) provides the following functions.</b></p> <ul style="list-style-type: none"> <li>- An MPEG decoder capable of processing HD/SD stream</li> <li>- SCTE55-1, 55-2 and DOCSIS Cable Modem for OOB Signaling</li> <li>- Digital AV transmission, such as IEEE1394 and HDMI</li> <li>- Content Protection</li> <li>- CableCARD Interface for CAS</li> <li>- OCAP™ 1.0 application platform</li> <li>- DVR Features</li> <li>- Recording :</li> </ul> <table border="1" data-bbox="375 545 1247 761"> <thead> <tr> <th>HDD</th><th>Capacity</th></tr> </thead> <tbody> <tr> <td>160GB</td><td>Up to 65 hours for SD (Standard Definition) stream Up to 15 hours for HD (High Definition) stream.</td></tr> <tr> <td>320GB</td><td>Up to 130 hours for SD (Standard Definition) stream Up to 30 hours for HD (High Definition) stream.</td></tr> </tbody> </table> <p>In the course of recording a television program, Samsung DVRs may generate index information using start code information. For example, in the Samsung DVRs, on information and belief, data streams in the form of MPEG2 transport stream packets are stored in blocks on the hard disk drive. Index information is stored on the hard disk drive as *.clt files, which have pointers to the locations of the MPEG2 transport stream packets of the various recorded programs.</p> <p>To the extent any differences are alleged to exist between this claim element and the above referenced functionality, such differences are insubstantial. On information and belief, the hardware and software in the Samsung DVRs perform substantially the same function as the Transform Object, for example that of storing and retrieving data streams onto a storage device, in substantially the same way, for example by using one or more instantiations of software codes and/or hardware/firmware combinations, to yield the same result, data and operations executing in the DVR that move video and audio data to and from storage locations.</p>	HDD	Capacity	160GB	Up to 65 hours for SD (Standard Definition) stream Up to 15 hours for HD (High Definition) stream.	320GB	Up to 130 hours for SD (Standard Definition) stream Up to 30 hours for HD (High Definition) stream.
HDD	Capacity						
160GB	Up to 65 hours for SD (Standard Definition) stream Up to 15 hours for HD (High Definition) stream.						
320GB	Up to 130 hours for SD (Standard Definition) stream Up to 30 hours for HD (High Definition) stream.						
[31e] wherein said source objects obtains a buffer from said transform object, said source object	A Samsung DVR provides a source object, a collection of data and operations that, among other things, obtains a buffer from the transform object, converts video data into data streams, and fills the buffer with the streams. Samsung DVR software obtains a buffer, converts video data into data streams and fills the buffer with the streams. <i>See, e.g.,</i> (BCM7400 Product Brief) ("The BCM7400 incorporates a complete MIPS32-Verified™ microprocessor subsystem, including caches with bridging to memory and a local bus.")						


the Claim	Samsung DVRs <sup>1</sup>
<p>converts video data into data streams and fills said buffer with said streams;</p>	<p>On information and belief, Samsung DVR software converts the data, for example, during selection of a particular channel, and similar functions, including without limitation recording a television program. <i>See, e.g.</i>, (BCM7400 Product Brief) (showing a MPEG-2/DVB Transport unit):</p> <div data-bbox="373 370 1585 1031"><p>The diagram illustrates the internal architecture of the BCM7400. At the top, various interfaces are shown: PCI 2.2 &amp; Flash, Dual SATA2, 64-bit DDR2-SDRAM, and two USB 2.0 ports (x2). The central processing area includes a Dual-Threaded MIPS® µP (32 KB I, 16 KB I, 16 KB D, 128 KB L2 FPU and MMU), a Secure Processor, a Bus Bridge, a DRAM Controller, a DMA, and a Video block containing scalers, compositors, digital noise reduction, deinterlacing, and picture-in-picture. It also features an Advanced 2D Graphics Display Engine, a 3D Graphics Rendering Engine, and Dual PVR Engine with Trick Modes. Input and output sections include ITU-R-656 Decoders, Dual ITU-R-656 I/S In x2, DCAS, SCARD, MCARD, and Transport Input x6 on the left; and IR In x2, UHF In x2, IR Out, UARTx3, GPIO, L x2, R x2, SPDIF, I/S Out x2, HD/SD Video, SD Video, ITU-R-656/TTX, HDMI, and NTSC Channel 3/4 on the right. Bottom interfaces include ISO7816 I/F x3, RMX x2, Dual 16-bit DDR2 Pixel Op Ports, Gateway Services, and BSC x5. Other components like Triple Composite NTSC/PAL VEC with 7 DACs and an RF Modulator are also present.</p></div> <p style="text-align: center;"><b>BCM7400 Block Diagram</b></p> <p>Also, a Samsung DVR has a buffer in the system memory. <i>See, e.g.</i>, (BCM7400 Product Brief) ("The BCM7400 incorporates a complete MIPS32-Verified™ microprocessor subsystem, including caches with bridging to memory and a local bus.").</p> <p>To the extent any differences are alleged to exist between this claim element and the above referenced functionality, such differences are insubstantial. On information and belief, the hardware and software in the Samsung DVRs perform substantially the same function as the Source Object, for example that of obtaining a memory location, converting the data stream, and filling the memory location in substantially the same way, for example by using one or more instantiations of software codes and/or hardware/firmware combinations, to yield the same result, data and operations executing in the DVR that operate on the video</p>



the Claim	Samsung DVRs <sup>1</sup>
	and audio data in conjunction with memory locations and other software processes.
[31f] wherein said source object is automatically flow controlled by said transform object;	<p>A Samsung DVR has a source object that, among other things, is automatically flow controlled by a transform object. On information and belief, the Samsung DVR software has self-regulating data flow in relation to, for example, the single-port DRAM. <i>See, e.g.</i>, (BCM7400 Product Brief) ("The BCM7400 incorporates a complete MIPS32-Verified™ microprocessor subsystem, including caches with bridging to memory and a local bus.").</p> 

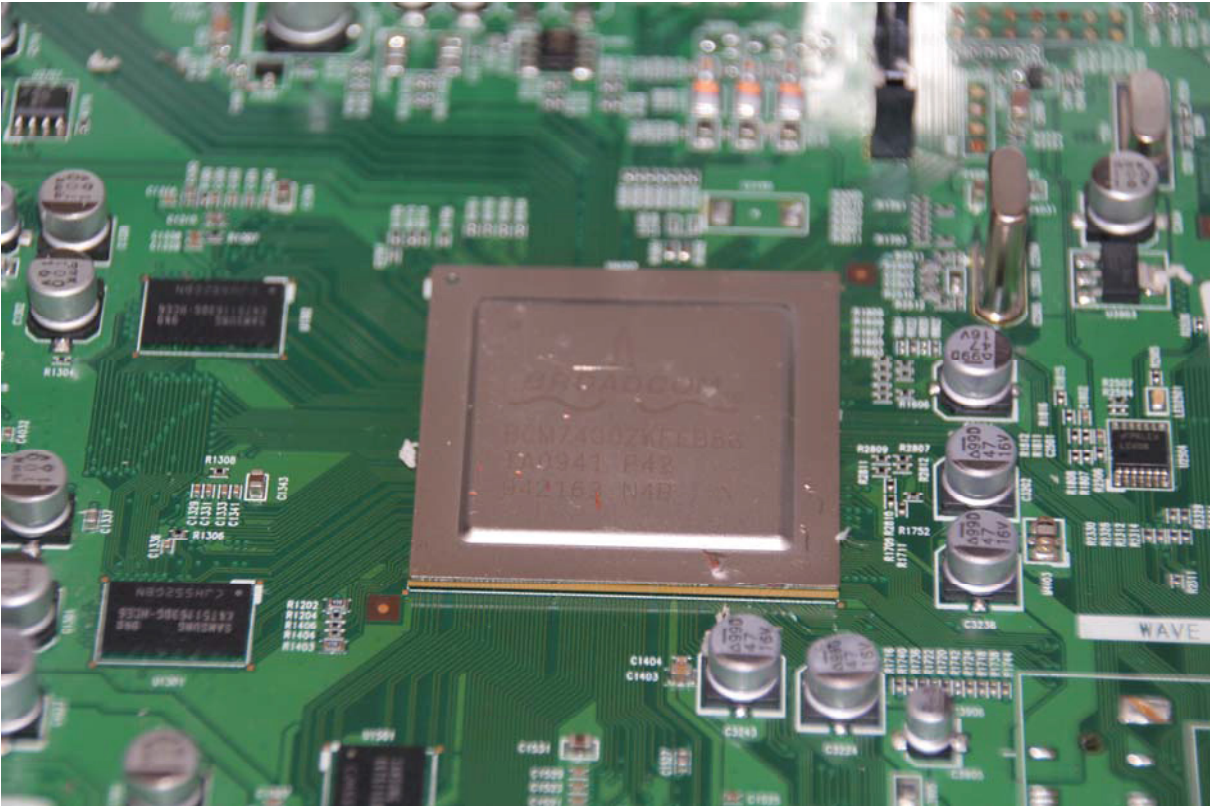
the Claim	Samsung DVRs <sup>1</sup>
	<div data-bbox="359 228 1562 1029"></div> <p data-bbox="1562 1003 1944 1036">(showing standard single-port Samsung K4T511630G 512MB RAM and Samsung K4H561638 RAM).</p> <p data-bbox="359 1109 1713 1141">In regular operation, there is no significant corruption of data due to overwriting or lack of self-regulation.</p> <p data-bbox="359 1179 1997 1357">To the extent any differences are alleged to exist between this claim element and the above referenced functionality, such differences are insubstantial. On information and belief, the hardware and software in the Samsung DVRs perform substantially the same function as the Transform Object's automatic flow control of the Source Object, for example that of self-regulating the processing, in substantially the same way, for example by using one or more instantiations of software codes and/or hardware/firmware combinations, to yield the same result, data and operations executing in the DVR that are self regulated.</p>
[31g] providing a sink object,	A Samsung DVR provides a sink object, a collection of data and operations that, among other things, obtains data stream buffers from a transform object and outputs the streams to a video and audio decoder. The Samsung DVR software obtains data streams

the Claim	Samsung DVRs <sup>1</sup>
<p>wherein said sink object obtains data stream buffers from said transform object and outputs said streams to a video and audio decoder;</p>	<p>from a buffer retrieved from a transform object and the hard disk drive and outputs the data streams to a video and audio decoder. <i>See, e.g.,</i> (BCM7400 Product Brief) ("The BCM7400 incorporates a complete MIPS32-Verified™ microprocessor subsystem, including caches with bridging to memory and a local bus.").</p> <p>A Samsung DVR has a video and audio decoder that converts data streams into display signals and sends those signals to a display. <i>See, e.g.,</i> (BCM7400 Product Brief):</p>  <p>The diagram is a detailed block diagram of the BCM7400 microprocessor subsystem. It features a central red rectangular area containing various functional blocks. At the top left is the 'Dual-Threaded MIPS® µP' with 32 KB I, 16 KB I, 16 KB D, 128 KB L2 FPU and MMU. To its right is a 'Bus Bridge' connected to 'PCI 2.2 &amp; Flash' and 'Dual SATA2'. Further right is a 'DRAM Controller' connected to '64-bit DDR2-SDRAM'. Below the µP is a 'Secure Processor' with 'ROM' and 'OTP' blocks. To the right of the secure processor is an 'Advanced 2D Graphics Display Engine' and a '3D Graphics Rendering Engine'. In the center is a 'Video' block with sub-blocks for 'Scalers', 'Compositors', 'Digital noise reduction', 'Deinterlacing', and 'Picture-in-Picture'. To the right of the video block is a 'Dual Multiformat Audio Processors' block. At the bottom left is an 'ITU-R-656 Decoders' block connected to 'Dual ITU-R-656 iPS In x2' and 'DCAS'. Below that is an 'MPEG-2/DVB Transport' block connected to 'SCARD MCARD' and 'Transport Input x6'. To the right of the transport block is a 'Dual PVR Engine with Trick Modes' and 'Dual High-Definition AVC/MPEG-2/VC-1 Video Decoders'. Further right is a 'Soft Modem, Si305X, Ethernet 10/100BASE-T' block connected to 'Gateway Services'. At the bottom right is a 'Triple Composite NTSC/PAL VEC with 7 DACs' block connected to 'BSC x5' and an 'RF Modulator'. On the far right, there are various output ports: 'IR In x2', 'UHF In x2', 'IR TX', 'IR Out', 'UARTx3', 'GPIO', 'L x2', 'R x2', 'SPDIF', 'iPS Out x2', 'HD/SD Video', 'SD Video', 'ITU-R-656/ TTX', 'HDMI', and 'NTSC Channel 3/4'. A 'DMA' block is centrally located, connecting the µP, DRAM Controller, and various other components. A 'BSC' block is also present, connected to the video and audio processors.</p> <p><b>BCM7400 Block Diagram</b></p> <p>(Samsung SMT-H3090 2008 User Guide), at 6:</p>

the Claim	Samsung DVRs <sup>1</sup>						
	<p><b>Digital HD DVR STB</b></p> <p>Digital HD DVR OCAP STB (Digital High-Definition Digital Video Recorder OpenCable Application Platform Set-Top Box) provides high quality video and audio broadcasting, and interactive services including Video-On-Demand.</p> <p><b>Digital HD DVR STB (SMT-H3090) provides the following functions .</b></p> <ul style="list-style-type: none"> <li>- An MPEG decoder capable of processing HD/SD stream</li> <li>- SCTE55-1 ,55-2 and DOCSIS Cable Modem for OOB Signaling</li> <li>- Digital AV transmission, such as IEEE1394 and HDMI</li> <li>- Content Protection</li> <li>- CableCARD Interface for CAS</li> <li>- OCAP™ 1.0 application platform</li> <li>- DVR Features</li> <li>- Recording :</li> </ul> <table> <tr> <th>HDD</th><th>Capacity</th></tr> <tr> <td><b>160GB</b></td><td>Up to 65 hours for SD (Standard Definition) stream Up to 15 hours for HD (High Definition) stream.</td></tr> <tr> <td><b>320GB</b></td><td>Up to 130 hours for SD (Standard Definition) stream Up to 30 hours for HD (High Definition) stream.</td></tr> </table> <p>(Samsung SMT-H3090 2008 Data Sheet), at 1:</p> <div>  <p>Imagine Samsung SMT-H3090 is Dual tuner Digital Video Recorder(DVR) which provides Standard Definition (SD), High-Definition(HD) and Analog video signals. Dual tuner DVR allows cable subscribers to watch and record two HD programs simultaneously.</p> </div> <p>(Samsung SMT-H3090 2008 Data Sheet), at 2:</p>	HDD	Capacity	<b>160GB</b>	Up to 65 hours for SD (Standard Definition) stream Up to 15 hours for HD (High Definition) stream.	<b>320GB</b>	Up to 130 hours for SD (Standard Definition) stream Up to 30 hours for HD (High Definition) stream.
HDD	Capacity						
<b>160GB</b>	Up to 65 hours for SD (Standard Definition) stream Up to 15 hours for HD (High Definition) stream.						
<b>320GB</b>	Up to 130 hours for SD (Standard Definition) stream Up to 30 hours for HD (High Definition) stream.						

the Claim	Samsung DVRs <sup>1</sup>														
	<p><b>Home Networking</b></p> <ul style="list-style-type: none"> <li>_ Contents sharing with networked media devices by using advanced Home network standards (DLNA, UPnP)</li> <li>_ DTCP-IP for Home network content protection</li> <li>_ MoCA (Multimedia over Coaxial Alliance) upgradable (Optional)</li> </ul> <p><b>Back Panel Features</b></p> <table border="1"> <thead> <tr> <th>Feature</th><th>Description</th></tr> </thead> <tbody> <tr> <td>RF Input</td><td>F-type Female</td></tr> <tr> <td>AV Out</td><td>2 NTSC-M RCA (CVBS), S-Video, Component (Y/Pb/Pr) Video, HDMI, 2 RCA, 2 S/PDIF (Optical, Electrical)</td></tr> <tr> <td>AV In</td><td>1 Component (Y/Pb/Pr) Video, 1 RCA (L/R)</td></tr> <tr> <td>Connections-Interactive</td><td>USB 2.0 Host, IEEE 1394, E-SATA, RJ-45 Ethernet (10/100M)</td></tr> <tr> <td>CableCARD</td><td>Multi-Stream CableCARD™</td></tr> <tr> <td>Power</td><td>AC 120V, 60Hz, AC Outlet</td></tr> </tbody> </table> <p>To the extent any differences are alleged to exist between this claim element and the above referenced functionality, such differences are insubstantial. On information and belief, the hardware and software in the Samsung DVRs perform substantially the same function as the Sink Object, for example that of obtaining buffers or pointers thereto and outputting data streams, in substantially the same way, for example by using one or more instantiations of software codes and/or hardware/firmware combinations, to yield the same result, datastreams being output to a decoder.</p>	Feature	Description	RF Input	F-type Female	AV Out	2 NTSC-M RCA (CVBS), S-Video, Component (Y/Pb/Pr) Video, HDMI, 2 RCA, 2 S/PDIF (Optical, Electrical)	AV In	1 Component (Y/Pb/Pr) Video, 1 RCA (L/R)	Connections-Interactive	USB 2.0 Host, IEEE 1394, E-SATA, RJ-45 Ethernet (10/100M)	CableCARD	Multi-Stream CableCARD™	Power	AC 120V, 60Hz, AC Outlet
Feature	Description														
RF Input	F-type Female														
AV Out	2 NTSC-M RCA (CVBS), S-Video, Component (Y/Pb/Pr) Video, HDMI, 2 RCA, 2 S/PDIF (Optical, Electrical)														
AV In	1 Component (Y/Pb/Pr) Video, 1 RCA (L/R)														
Connections-Interactive	USB 2.0 Host, IEEE 1394, E-SATA, RJ-45 Ethernet (10/100M)														
CableCARD	Multi-Stream CableCARD™														
Power	AC 120V, 60Hz, AC Outlet														
[31h] wherein said decoder converts said streams into display signals and sends said signals to a display;	<p>A Samsung DVR has a decoder that converts data streams into display signals and sends those signals to a display. <i>See, e.g.</i>, (Broadcom BCM 7400 Product Brief), at 1:</p> <div data-bbox="365 1135 1075 1364"> <p><b>FEATURES</b></p> <ul style="list-style-type: none"> <li>• <b>Dual advanced AVC/MPEG-2/VC-1 decoders</b> <ul style="list-style-type: none"> <li>• H.264/AVC Main and High Profile to Level 4.1</li> <li>• VC-1 Advanced Profile @ Level 3</li> <li>• VC-1 Simple and Main Profile</li> <li>• HD MPEG-2 and SD MPEG-2</li> <li>• MPEG still-picture decode</li> <li>• DivX<sup>®</sup> and MPEG4 part 2 ASP decode</li> </ul> </li> </ul> </div> <p>(Broadcom BCM 7400 Product Brief), at 2 (showing video decoders):</p>														

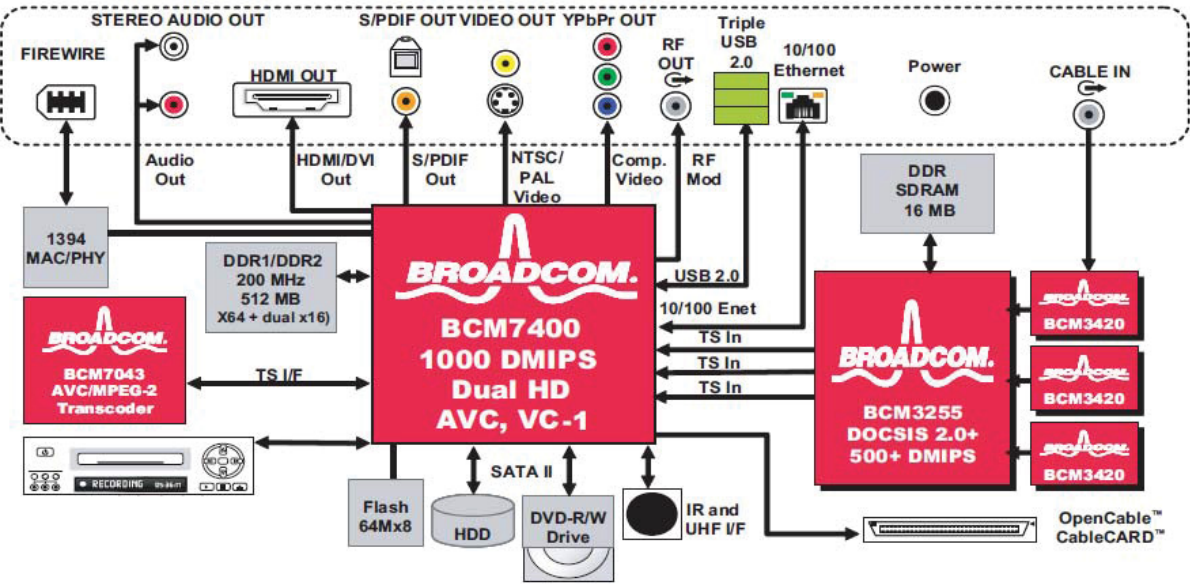


the Claim	Samsung DVRs <sup>1</sup>
<p>[31i] wherein said sink object is automatically flow controlled by said transform object;</p>	<p>A Samsung DVR has a sink object that, among other things, is automatically flow controlled by a transform object. On information and belief, the Samsung DVR playback software has self-regulated data flow in relation to, for example, the DRAM. <i>See, e.g.,</i> (BCM7400 Product Brief) ("The BCM7400 incorporates a complete MIPS32-Verified™ microprocessor subsystem, including caches with bridging to memory and a local bus.").</p>  <p>In regular operation, there is no significant corruption of data due to overwriting or lack of self-regulation.</p> <p>To the extent any differences are alleged to exist between this claim element and the above referenced functionality, such differences are insubstantial. On information and belief, the hardware and software in the Samsung DVRs perform substantially the same function as the Transform Object's automatic flow control of the Sink Object, for example that of self-regulating the processing, in substantially the same way, for example by using one or more instantiations of software codes and/or</p>

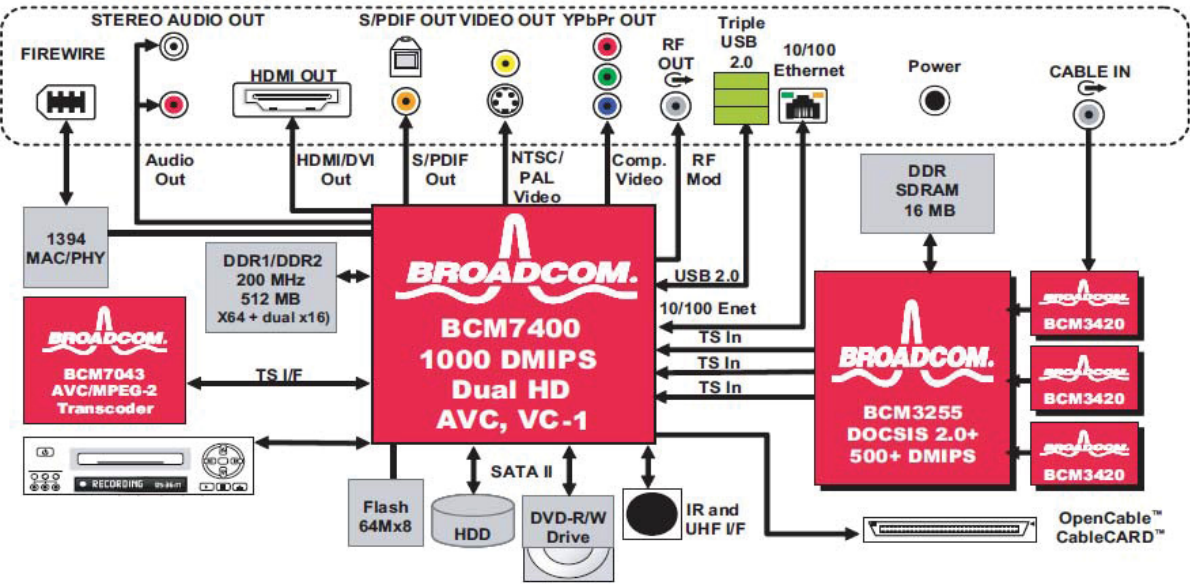
the Claim	Samsung DVRs <sup>1</sup>
	hardware/firmware combinations, to yield the same result, data and operations executing in the DVR that are self regulated.
<p>[31j] providing a control object, wherein said control object receives commands from a user, said commands control the flow of the broadcast data through the system; and</p>	<p>A Samsung DVR provides a control object, a collection of data and operations that, among other things, receives user commands, which control the flow of the broadcast data through the system. The Samsung DVR software is responsive to front panel buttons and a remote control. On information and belief, the remote control sends IR signals that are received by the Samsung DVR. The hardware and software receives user commands, which control the flow of data through the system, e.g., begin recording, channel change, trickplay, etc. <i>See, e.g.</i>, (BCM7400 Product Brief) (showing front panel controls input to the BCM7400 chip):</p> <p><a href="http://www.timewarnercable.com/MediaLibrary/1/1/FAQ/Digital%20Cable/Samsung/Samsung_SMT_3090HD_UserGuide.pdf">http://www.timewarnercable.com/MediaLibrary/1/1/FAQ/Digital%20Cable/Samsung/Samsung_SMT_3090HD_UserGuide.pdf</a> (Samsung SMT-H3090 2008 User Guide), at 10:</p>



the Claim	Samsung DVRs <sup>1</sup>																		
	<p><b>DVR Features</b></p> <p>SMT-H3090 supports DVR feature through the Hard Disk Drive as follows.</p> <table border="1"> <thead> <tr> <th>Feature</th><th>Description</th></tr> </thead> <tbody> <tr> <td><b>File Playback</b></td><td>Play, Stop, Rewind, Pause for recorded contents.</td></tr> <tr> <td><b>File Trick Mode</b></td><td>1, 4, 8, 32 times FFP (Fast Forward Play) 1, 4, 8, 32 times FRP (Fast Rewind Play) 1/2, frame by frame skipping SFP (Slow Forward Play) 1/2, Frame by frame SRP (Slow Rewind Play)</td></tr> <tr> <td><b>Time-Shift Recording</b></td><td>User can pause live TV program for a certain amount of time, and resume it to watch. The STB allows 90 minutes of recording for Time-shift recording.</td></tr> <tr> <td><b>Instant Recording</b></td><td>Record live TV program instantly</td></tr> <tr> <td><b>Watching and Recording</b></td><td>Record two live TV programs simultaneously while watching two recorded programs on HDD.</td></tr> <tr> <td><b>Audio/Radio Recording</b></td><td>Audio or Radio program recording</td></tr> <tr> <td><b>Simultaneous Recording and Time Shift Recording</b></td><td>Up to two Simultaneous Recording and Time-Shift Recording on live TV programs</td></tr> <tr> <td><b>EPG Recording</b></td><td>Scheduled recording using EPG</td></tr> </tbody> </table> <p>To the extent any differences are alleged to exist between this claim element and the above referenced functionality, such differences are insubstantial. On information and belief, the hardware and software in the Samsung DVRs perform substantially the same function as the Control Object, for example that of receiving commands same way, for example by using one or more instantiations of software codes and/or hardware/firmware combinations, to yield the same result, controlling the flow of the broadcast data through the system.</p>	Feature	Description	<b>File Playback</b>	Play, Stop, Rewind, Pause for recorded contents.	<b>File Trick Mode</b>	1, 4, 8, 32 times FFP (Fast Forward Play) 1, 4, 8, 32 times FRP (Fast Rewind Play) 1/2, frame by frame skipping SFP (Slow Forward Play) 1/2, Frame by frame SRP (Slow Rewind Play)	<b>Time-Shift Recording</b>	User can pause live TV program for a certain amount of time, and resume it to watch. The STB allows 90 minutes of recording for Time-shift recording.	<b>Instant Recording</b>	Record live TV program instantly	<b>Watching and Recording</b>	Record two live TV programs simultaneously while watching two recorded programs on HDD.	<b>Audio/Radio Recording</b>	Audio or Radio program recording	<b>Simultaneous Recording and Time Shift Recording</b>	Up to two Simultaneous Recording and Time-Shift Recording on live TV programs	<b>EPG Recording</b>	Scheduled recording using EPG
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[31k] wherein said control object sends flow command events to said source, transform, and	A Samsung DVR provides a control object, a collection of data and operations that, among other things, sends flow command events to source, transform, and sink objects. On information and belief, the remote control sends IR signals that are received by the Samsung DVR. The Samsung DVR software is responsive to front panel buttons and a remote control. The hardware and software receives user commands and sends command events to other portions of the software to control the various functions of the unit, e.g., channel selection, start recording, trickplay, picture-in-picture, etc. <i>See, e.g.</i> , (BCM7400 Product Brief) (showing front panel controls input to the BCM7400 chip):																		

the Claim	Samsung DVRs <sup>1</sup>
sink objects.	 <p>The diagram illustrates the system architecture of the Samsung SMT 3090HD DVR. At the center is the <b>BROADCOM BCM7400 1000 DMIPS Dual HD AVC, VC-1</b> processor. This central unit is connected to various components:</p> <ul style="list-style-type: none"> <li><b>Inputs/Outputs (top):</b> FIREWIRE, STEREO AUDIO OUT, S/PDIF OUT, VIDEO OUT, YPbPr OUT, Triple USB 2.0, 10/100 Ethernet, Power, and CABLE IN.</li> <li><b>Left Side:</b> A <b>1394 MAC/PHY</b> chip connects to the central processor. Below it is the <b>BROADCOM BCM7043 AVC/MPEG-2 Transcoder</b>. A <b>DDR1/DDR2 200 MHz 512 MB X64 + dual x16</b> memory block is also connected to the central processor.</li> <li><b>Bottom Left:</b> A <b>Flash 64Mx8</b> chip, an <b>HDD</b>, and a <b>DVD-R/W Drive</b> are connected to the central processor via <b>SATA II</b> and <b>IR and UHF I/F</b> interfaces.</li> <li><b>Right Side:</b> A <b>DDR SDRAM 16 MB</b> chip is connected to the central processor. Below it is the <b>BROADCOM BCM3255 DOCSIS 2.0+ 500+ DMIPS</b> chip, which is further connected to three <b>BCM3420</b> chips. An <b>OpenCable™ CableCARD™</b> is also shown at the bottom right.</li> <li><b>Internal Connections:</b> The central processor is connected to the transcoder via <b>TS I/F</b> and to the DOCSIS chip via <b>TS In</b> and <b>10/100 Enet</b> interfaces.</li> </ul> <p><a href="http://www.timewarnercable.com/MediaLibrary/1/1/FAQ/Digital%20Cable/Samsung/Samsung_SMT_3090HD_UserGuide.pdf">http://www.timewarnercable.com/MediaLibrary/1/1/FAQ/Digital%20Cable/Samsung/Samsung_SMT_3090HD_UserGuide.pdf</a>  (Samsung SMT-H3090 2008 User Guide), at 10:</p>

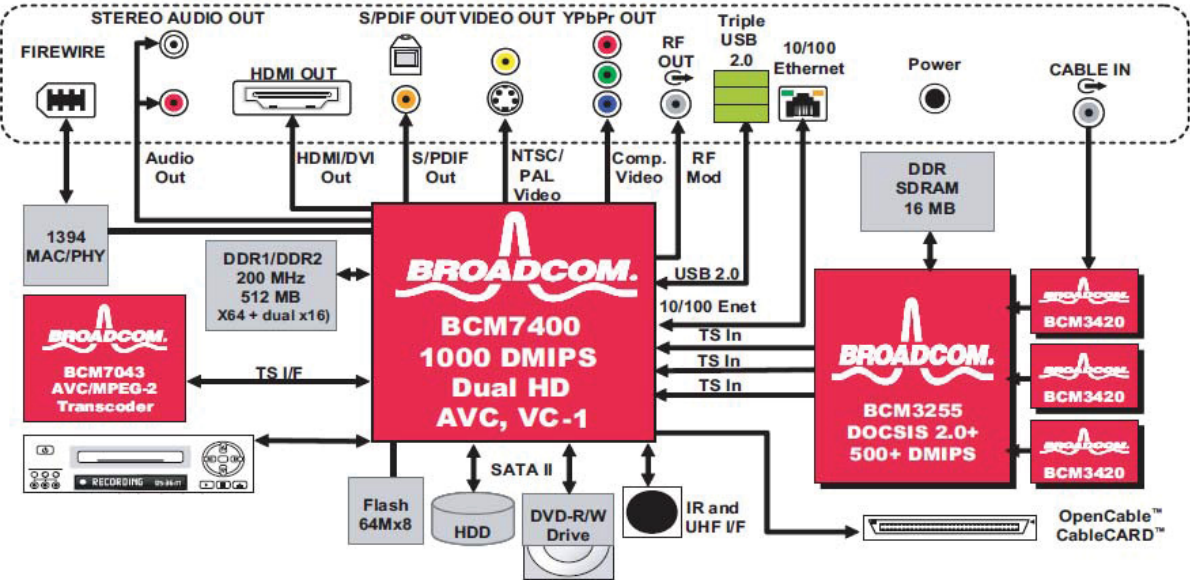
the Claim	Samsung DVRs <sup>1</sup>																		
	<p data-bbox="365 240 667 284"><b>DVR Features</b></p> <p data-bbox="365 298 1079 323">SMT-H3090 supports DVR feature through the Hard Disk Drive as follows.</p> <table data-bbox="365 355 1163 941"> <tr> <th data-bbox="365 355 659 399">Feature</th><th data-bbox="659 355 1163 399">Description</th></tr> <tr> <td data-bbox="365 399 659 443"><b>File Playback</b></td><td data-bbox="659 399 1163 443">Play, Stop, Rewind, Pause for recorded contents.</td></tr> <tr> <td data-bbox="365 443 659 586"><b>File Trick Mode</b></td><td data-bbox="659 443 1163 586">           1, 4, 8, 32 times FFP (Fast Forward Play)            1, 4, 8, 32 times FRP (Fast Rewind Play)            1/2, frame by frame skipping SFP (Slow Forward Play)            1/2, Frame by frame SRP (Slow Rewind Play)         </td></tr> <tr> <td data-bbox="365 586 659 678"><b>Time-Shift Recording</b></td><td data-bbox="659 586 1163 678">User can pause live TV program for a certain amount of time, and resume it to watch. The STB allows 90 minutes of recording for Time-shift recording.</td></tr> <tr> <td data-bbox="365 678 659 722"><b>Instant Recording</b></td><td data-bbox="659 678 1163 722">Record live TV program instantly</td></tr> <tr> <td data-bbox="365 722 659 789"><b>Watching and Recording</b></td><td data-bbox="659 722 1163 789">Record two live TV programs simultaneously while watching two recorded programs on HDD.</td></tr> <tr> <td data-bbox="365 789 659 833"><b>Audio/Radio Recording</b></td><td data-bbox="659 789 1163 833">Audio or Radio program recording</td></tr> <tr> <td data-bbox="365 833 659 899"><b>Simultaneous Recording and Time Shift Recording</b></td><td data-bbox="659 833 1163 899">Up to two Simultaneous Recording and Time-Shift Recording on live TV programs</td></tr> <tr> <td data-bbox="365 899 659 941"><b>EPG Recording</b></td><td data-bbox="659 899 1163 941">Scheduled recording using EPG</td></tr> </table> <p data-bbox="357 997 1995 1175">To the extent any differences are alleged to exist between this claim element and the above referenced functionality, such differences are insubstantial. On information and belief, the hardware and software in the Samsung DVRs perform substantially the same function as the Control Object, for example that of sending flow commands to the other DVR processes, for example by using one or more instantiations of software codes and/or hardware/firmware combinations, to yield the same result, controlling the flow of the broadcast data through the system.</p>	Feature	Description	<b>File Playback</b>	Play, Stop, Rewind, Pause for recorded contents.	<b>File Trick Mode</b>	1, 4, 8, 32 times FFP (Fast Forward Play) 1, 4, 8, 32 times FRP (Fast Rewind Play) 1/2, frame by frame skipping SFP (Slow Forward Play) 1/2, Frame by frame SRP (Slow Rewind Play)	<b>Time-Shift Recording</b>	User can pause live TV program for a certain amount of time, and resume it to watch. The STB allows 90 minutes of recording for Time-shift recording.	<b>Instant Recording</b>	Record live TV program instantly	<b>Watching and Recording</b>	Record two live TV programs simultaneously while watching two recorded programs on HDD.	<b>Audio/Radio Recording</b>	Audio or Radio program recording	<b>Simultaneous Recording and Time Shift Recording</b>	Up to two Simultaneous Recording and Time-Shift Recording on live TV programs	<b>EPG Recording</b>	Scheduled recording using EPG
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the Claim	Samsung DVRs <sup>1</sup>
	 <p>To the extent any differences are alleged to exist between this claim element and the above referenced functionality, such differences are insubstantial. On information and belief, the hardware and software in the Samsung DVRs perform substantially the same function as the physical data source, for example that accepting, parsing, and temporarily storing, in substantially the same way, for example by receiving data that has been transmitted to the DVR, PID filtering, startcode detecting and otherwise analyzing that data, and writing that data to memory locations and disks, to yield the same result, a properly formatted data stream for further processing by the rest of the system.</p>
[61c] a source object, wherein said source object extracts video and audio data from said physical data source;	<p>A Samsung DVR provides a source object, a collection of data and operations that, among other things, extracts video and audio data from the physical data source. For example, in a Samsung DVR, video and audio data move from the Broadcom BCM3255 chip, or similar chip, to memory, including DRAM and/or the Data Transport processor of the Broadcom 7400 chip, or similar chip, and from the BCM7400 chip, or similar chip, to memory, including DRAM. <i>See, e.g.,</i> (BCM7400 Product Brief) (showing Transport Input data going into MPEG-2/DVB Transport of the Broadcom BCM7400 chip:</p>

the Claim	Samsung DVRs <sup>1</sup>
	<div data-bbox="373 228 1585 893"><p>The diagram illustrates the internal architecture of the BCM7400 chip, which is a System-on-Chip (SoC) for digital video recording. It features a central processing unit (MIPS μP) with 32 KB I-cache, 16 KB D-cache, and 128 KB L2 FPU and MMU. This is connected to a Bus Bridge, which manages data flow between various components. Key components include a Secure Processor with ROM and OTP, an Advanced 2D Graphics Display Engine, a 3D Graphics Rendering Engine, and a Video block containing scalers, compositors, digital noise reduction, deinterlacing, and picture-in-picture. The chip also includes dual multiformat audio processors, a PCM audio engine with DACs, and a triple composite NTSC/PAL VEC with 7 DACs. External interfaces are shown on the top (PCI 2.2 &amp; Flash, Dual SATA2, 64-bit DDR2-SDRAM, USB 2.0 x2), right (IR In/Out, UHF In/Out, Triple UARTs, GPIO, L/R x2, SPDIF, iPS Out x2, HD/SD Video, SD Video, ITU-R-656/TTX, HDMI, NTSC Channel 3/4), and bottom (ISO7816 I/F x3, RMX x2, Dual 16-bit DDR2 Pixel Op Ports, Gateway Services, BSC x5). On the left, it shows dual ITU-R-656 iPS In x2, DCAS, SCARD, MCARD, and Transport Input x6.</p></div> <p style="text-align: center;"><b>BCM7400 Block Diagram</b></p> <p>(BCM7400 Product Brief) (showing data moving out of BCM3255 to BCM7400, and showing data moving to and from the 512 MB 64-bit DDR RAM and the BCM7400 chip):</p>



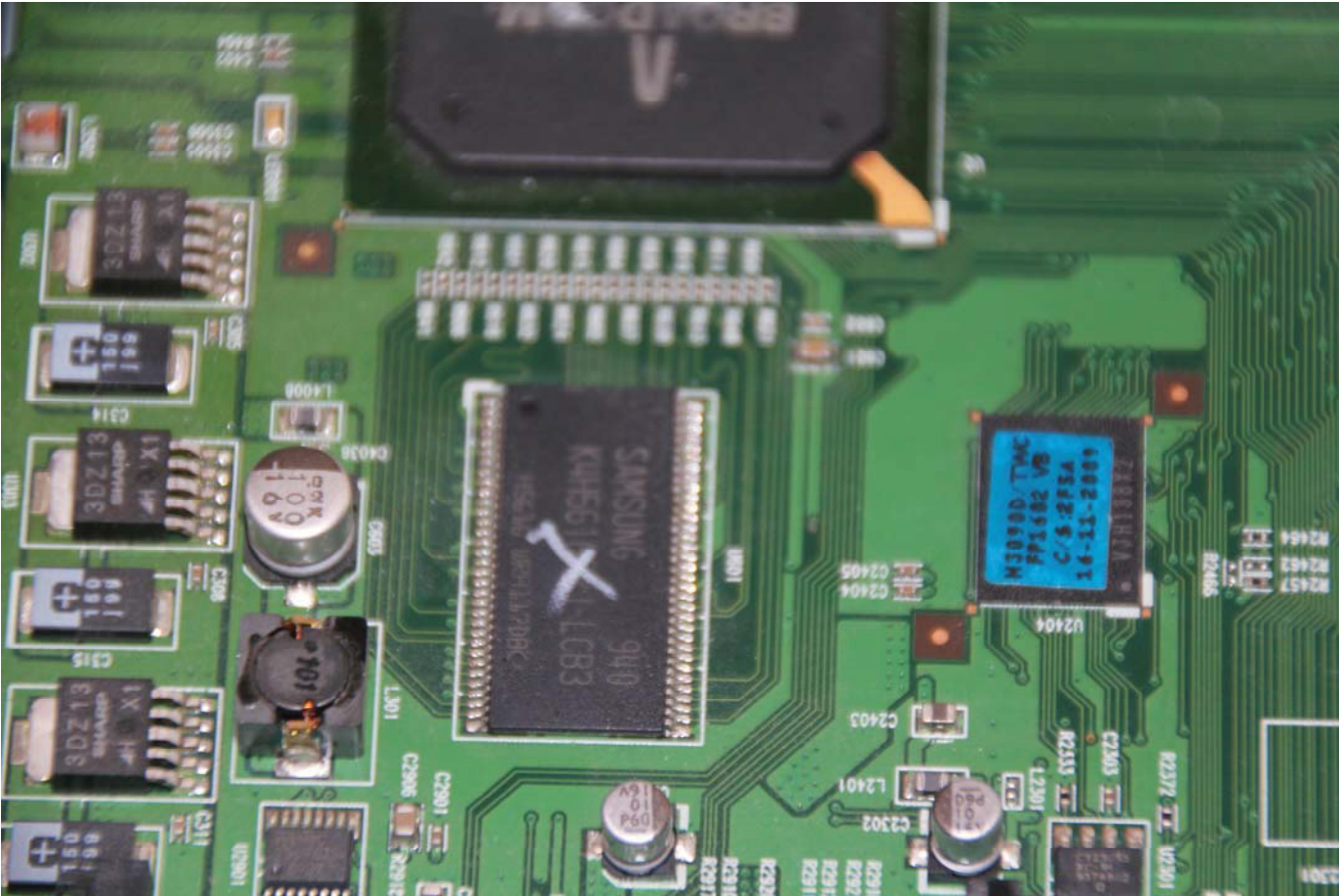


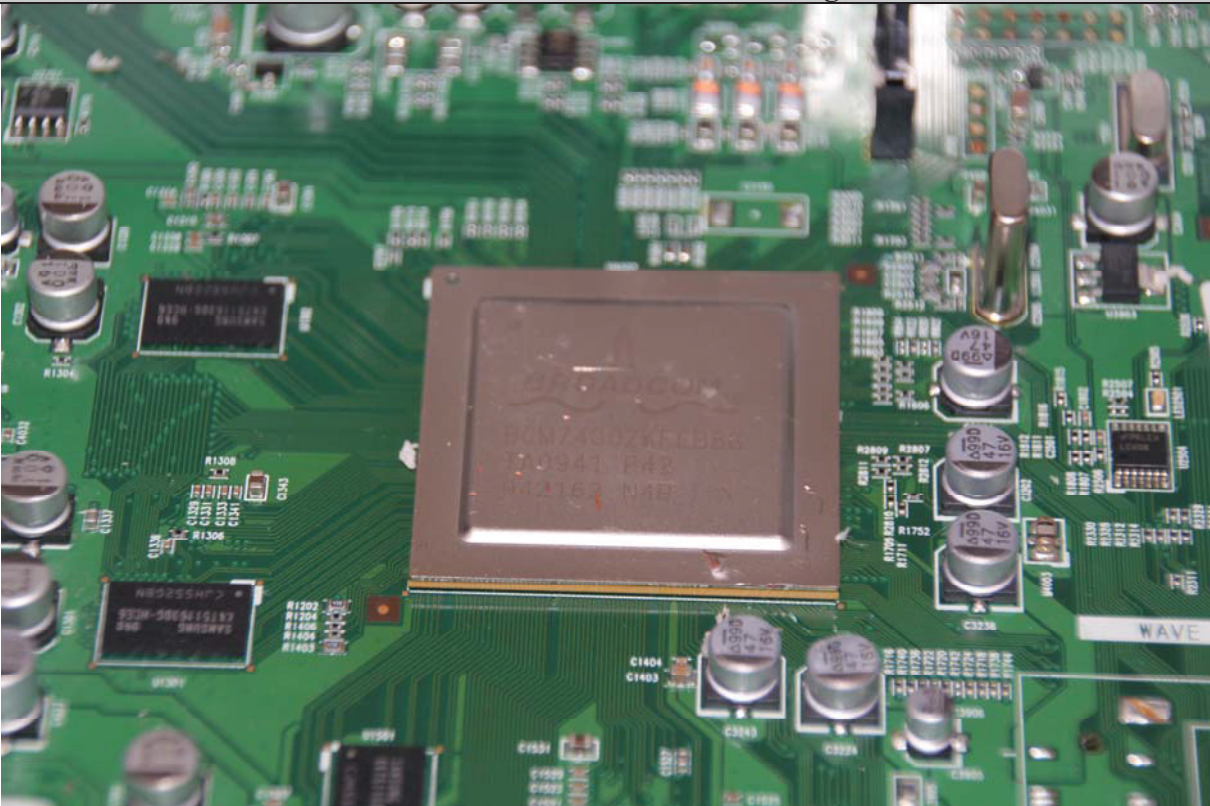
the Claim	Samsung DVRs <sup>1</sup>
	<p>(Samsung SMT-H3090 2008 User Guide), p. 10 ("User can pause live TV program for a certain amount of time, and resume it to watch. The STB allows 90 minutes of recording for Time-shift recording."); p. 10 ("Record two live TV programs simultaneously while watching two recorded programs on HDD.")</p> <p>Samsung DVRs store data streams on and retrieve data streams from a hard disk drive (HDD) during recording and playback, respectively. <i>See, e.g.,</i> (BCM7400 Product Brief) (showing SATA II interface to HDD):</p>  <p><a href="http://www.timewarnercable.com/MediaLibrary/1/1/FAQ/Digital%20Cable/Samsung/Samsung_SMT_3090HD_UserGuide.pdf">http://www.timewarnercable.com/MediaLibrary/1/1/FAQ/Digital%20Cable/Samsung/Samsung_SMT_3090HD_UserGuide.pdf</a> (Samsung SMT-H3090 2008 User Guide), at 6:</p>



the Claim	Samsung DVRs <sup>1</sup>						
	<p><b>Digital HD DVR STB (SMT-H3090) provides the following functions.</b></p> <ul style="list-style-type: none"> <li>- An MPEG decoder capable of processing HD/SD stream</li> <li>- SCTE55-1, 55-2 and DOCSIS Cable Modem for OOB Signaling</li> <li>- Digital AV transmission, such as IEEE1394 and HDMI</li> <li>- Content Protection</li> <li>- CableCARD Interface for CAS</li> <li>- OCAP™ 1.0 application platform</li> <li>- DVR Features</li> <li>- Recording :</li> </ul> <table border="1"> <thead> <tr> <th>HDD</th><th>Capacity</th></tr> </thead> <tbody> <tr> <td>160GB</td><td>Up to 65 hours for SD (Standard Definition) stream Up to 15 hours for HD (High Definition) stream.</td></tr> <tr> <td>320GB</td><td>Up to 130 hours for SD (Standard Definition) stream Up to 30 hours for HD (High Definition) stream.</td></tr> </tbody> </table> <p>In the course of recording a television program, Samsung DVRs may generate index information using start code information. For example, in the Samsung DVRs, on information and belief, data streams in the form of MPEG2 transport stream packets are stored in blocks on the hard disk drive. Index information is stored on the hard disk drive as *.clt files, which have pointers to the locations of the MPEG2 transport stream packets of the various recorded programs.</p> <p>To the extent any differences are alleged to exist between this claim element and the above referenced functionality, such differences are insubstantial. On information and belief, the hardware and software in the Samsung DVRs perform substantially the same function as the Transform Object, for example that of storing and retrieving data streams onto a storage device, in substantially the same way, for example by using one or more instantiations of software codes and/or hardware/firmware combinations, to yield the same result, data and operations executing in the DVR that move video and audio data to and from storage locations.</p>	HDD	Capacity	160GB	Up to 65 hours for SD (Standard Definition) stream Up to 15 hours for HD (High Definition) stream.	320GB	Up to 130 hours for SD (Standard Definition) stream Up to 30 hours for HD (High Definition) stream.
HDD	Capacity						
160GB	Up to 65 hours for SD (Standard Definition) stream Up to 15 hours for HD (High Definition) stream.						
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[61e] wherein said source object obtains a buffer from said transform object, said source object	A Samsung DVR provides a source object, a collection of data and operations that, among other things, obtains a buffer from the transform object, converts video data into data streams, and fills the buffer with the streams. Samsung DVR software obtains a buffer, converts video data into data streams and fills the buffer with the streams. <i>See, e.g.,</i> (BCM7400 Product Brief) ("The BCM7400 incorporates a complete MIPS32-Verified™ microprocessor subsystem, including caches with bridging to memory and a local bus.")						


the Claim	Samsung DVRs <sup>1</sup>
<p>converts video data into data streams and fills said buffer with said streams;</p>	<p>On information and belief, Samsung DVR software converts the data, for example, during selection of a particular channel, and similar functions, including without limitation recording a television program. <i>See, e.g.</i>, (BCM7400 Product Brief) (showing a MPEG-2/DVB Transport unit):</p> <div data-bbox="367 365 1585 1031"><p>The diagram illustrates the internal architecture of the BCM7400. At the top, various interfaces are shown: PCI 2.2 &amp; Flash, Dual SATA2, 64-bit DDR2-SDRAM, and two USB 2.0 ports (x2). The central processing area includes a Dual-Threaded MIPS® µP (32 KB I, 16 KB I, 16 KB D, 128 KB L2 FPU and MMU), a Secure Processor, a Bus Bridge, a DRAM Controller, a DMA, and a Video block containing scalers, compositors, digital noise reduction, deinterlacing, and picture-in-picture. It also features an Advanced 2D Graphics Display Engine, a 3D Graphics Rendering Engine, and Dual PVR Engine with Trick Modes. On the left, there are dual ITU-R-656 PS In x2, DCAS, SCARD, and MCARD inputs, along with Transport Input x6. On the right, outputs include IR In x2, UHF In x2, IR Out, UARTx3, GPIO, L x2, R x2, SPDIF, PS Out x2, HD/SD Video, SD Video, ITU-R-656/TTX, HDMI, and NTSC Channel 3/4. Other components include a Triple Composite NTSC/PAL VEC with 7 DACs, an RF Modulator, a BSC, and a BSC x5. At the bottom, there are ISO7816 I/F x3, RMX x2, Dual 16-bit DDR2 Pixel Op Ports, and Gateway Services.</p></div> <p style="text-align: center;"><b>BCM7400 Block Diagram</b></p> <p>Also, a Samsung DVR has a buffer in the system memory. <i>See, e.g.</i>, (BCM7400 Product Brief) ("The BCM7400 incorporates a complete MIPS32-Verified™ microprocessor subsystem, including caches with bridging to memory and a local bus.").</p> <p>To the extent any differences are alleged to exist between this claim element and the above referenced functionality, such differences are insubstantial. On information and belief, the hardware and software in the Samsung DVRs perform substantially the same function as the Source Object, for example that of obtaining a memory location, converting the data stream, and filling the memory location in substantially the same way, for example by using one or more instantiations of software codes and/or hardware/firmware combinations, to yield the same result, data and operations executing in the DVR that operate on the video</p>

the Claim	Samsung DVRs <sup>1</sup>
	and audio data in conjunction with memory locations and other software processes.
[61f] wherein said source object is automatically flow controlled by said transform object;	<p>A Samsung DVR has a source object that, among other things, is automatically flow controlled by a transform object. On information and belief, the Samsung DVR software has self-regulating data flow in relation to, for example, the single-port DRAM. <i>See, e.g.</i>, (BCM7400 Product Brief) ("The BCM7400 incorporates a complete MIPS32-Verified™ microprocessor subsystem, including caches with bridging to memory and a local bus.").</p> 

the Claim	Samsung DVRs <sup>1</sup>
	<div data-bbox="359 228 1562 1029"></div> <p data-bbox="1562 1003 1944 1036">(showing standard single-port Samsung K4T511630G 512MB RAM and Samsung K4H561638 RAM).</p> <p data-bbox="359 1109 1713 1141">In regular operation, there is no significant corruption of data due to overwriting or lack of self-regulation.</p> <p data-bbox="359 1179 1997 1357">To the extent any differences are alleged to exist between this claim element and the above referenced functionality, such differences are insubstantial. On information and belief, the hardware and software in the Samsung DVRs perform substantially the same function as the Transform Object's automatic flow control of the Source Object, for example that of self-regulating the processing, in substantially the same way, for example by using one or more instantiations of software codes and/or hardware/firmware combinations, to yield the same result, data and operations executing in the DVR that are self regulated.</p>
[61g] a sink object, wherein	A Samsung DVR provides a sink object, a collection of data and operations that, among other things, obtains data stream buffers from a transform object and outputs the streams to a video and audio decoder. The Samsung DVR software obtains data streams



the Claim	Samsung DVRs <sup>1</sup>
<p>said sink object obtains data stream buffers from said transform object and outputs said streams to a video and audio decoder;</p>	<p>from a buffer retrieved from a transform object and the hard disk drive and outputs the data streams to a video and audio decoder. <i>See, e.g.</i>, (BCM7400 Product Brief) ("The BCM7400 incorporates a complete MIPS32-Verified™ microprocessor subsystem, including caches with bridging to memory and a local bus.").</p> <p>A Samsung DVR has a video and audio decoder that converts data streams into display signals and sends those signals to a display. <i>See, e.g.</i>, (BCM7400 Product Brief):</p> <div data-bbox="373 477 1583 1201"><p>The BCM7400 Block Diagram illustrates the internal architecture of the Samsung DVR. At the top, external interfaces include PCI 2.2 &amp; Flash, Dual SATA2, 64-bit DDR2-SDRAM, and two USB 2.0 ports (x2). The central processing unit consists of a Dual-Threaded MIPS® µP (32 KB I, 16 KB I, 16 KB D, 128 KB L2 FPU and MMU) connected to a Bus Bridge, which in turn connects to a DRAM Controller and a DMA. A Secure Processor (ROM, OTP) is also connected to the Bus Bridge. The Video section includes an Advanced 2D Graphics Display Engine, a 3D Graphics Rendering Engine, and a Video block containing Scalers, Compositors, Digital noise reduction, Deinterlacing, and Picture-in-Picture. The Audio section features Dual Multiformat Audio Processors and a PCM Audio Engine and DACs. The Transport section includes ITU-R-656 Decoders, a MPEG-2/DVB Transport block, and a Dual PVR Engine with Trick Modes. Other components include a Soft Modem (Si305X, Ethernet 10/100BASE-T), a BSC, and an RF Modulator. The diagram also shows various input and output ports: IR In x2, UHF In x2, IR Out, UARTx3, GPIO, L x2, R x2, SPDIF, iS Out x2, HD/SD Video, SD Video, ITU-R-656/TTX, HDMI, NTSC Channel 3/4, ISO7816 I/F x3, RMX x2, Dual 16-bit DDR2 Pixel Op Ports, Gateway Services, and BSC x5.</p><p style="text-align: center;"><b>BCM7400 Block Diagram</b></p></div> <p>(Samsung SMT-H3090 2008 User Guide), at 6:</p>

the Claim	Samsung DVRs <sup>1</sup>						
	<p><b>Digital HD DVR STB</b></p> <p>Digital HD DVR OCAP STB (Digital High-Definition Digital Video Recorder OpenCable Application Platform Set-Top Box) provides high quality video and audio broadcasting, and interactive services including Video-On-Demand.</p> <p><b>Digital HD DVR STB (SMT-H3090) provides the following functions .</b></p> <ul style="list-style-type: none"> <li>- An MPEG decoder capable of processing HD/SD stream</li> <li>- SCTE55-1 ,55-2 and DOCSIS Cable Modem for OOB Signaling</li> <li>- Digital AV transmission, such as IEEE1394 and HDMI</li> <li>- Content Protection</li> <li>- CableCARD Interface for CAS</li> <li>- OCAP™ 1.0 application platform</li> <li>- DVR Features</li> <li>- Recording :</li> </ul> <table border="1"> <thead> <tr> <th>HDD</th><th>Capacity</th></tr> </thead> <tbody> <tr> <td><b>160GB</b></td><td>Up to 65 hours for SD (Standard Definition) stream Up to 15 hours for HD (High Definition) stream.</td></tr> <tr> <td><b>320GB</b></td><td>Up to 130 hours for SD (Standard Definition) stream Up to 30 hours for HD (High Definition) stream.</td></tr> </tbody> </table> <p>(Samsung SMT-H3090 2008 Data Sheet), at 1:</p> <div data-bbox="359 989 1360 1261">  <p>Imagine Samsung SMT-H3090 is Dual tuner Digital Video Recorder(DVR) which provides Standard Definition (SD), High-Definition(HD) and Analog video signals. Dual tuner DVR allows cable subscribers to watch and record two HD programs simultaneously.</p> </div> <p>(Samsung SMT-H3090 2008 Data Sheet), at 2:</p>	HDD	Capacity	<b>160GB</b>	Up to 65 hours for SD (Standard Definition) stream Up to 15 hours for HD (High Definition) stream.	<b>320GB</b>	Up to 130 hours for SD (Standard Definition) stream Up to 30 hours for HD (High Definition) stream.
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<b>160GB</b>	Up to 65 hours for SD (Standard Definition) stream Up to 15 hours for HD (High Definition) stream.						
<b>320GB</b>	Up to 130 hours for SD (Standard Definition) stream Up to 30 hours for HD (High Definition) stream.						

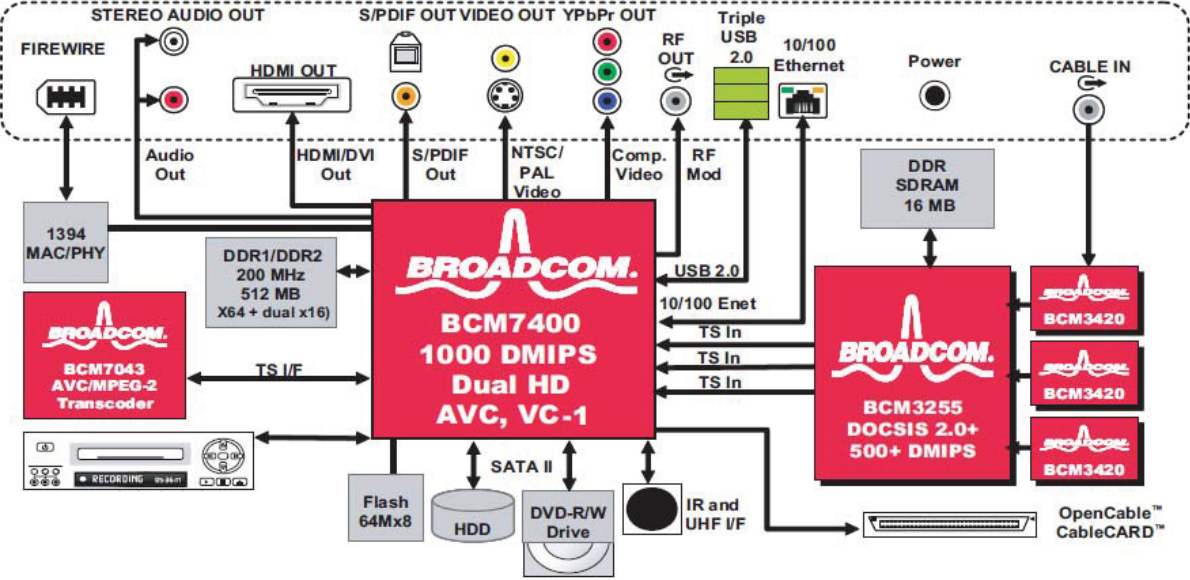
the Claim	Samsung DVRs <sup>1</sup>														
	<p><b>Home Networking</b></p> <ul style="list-style-type: none"> <li>_ Contents sharing with networked media devices by using advanced Home network standards (DLNA, UPnP)</li> <li>_ DTCP-IP for Home network content protection</li> <li>_ MoCA (Multimedia over Coaxial Alliance) upgradable (Optional)</li> </ul> <p><b>Back Panel Features</b></p> <table border="1"> <thead> <tr> <th>Feature</th><th>Description</th></tr> </thead> <tbody> <tr> <td>RF Input</td><td>F-type Female</td></tr> <tr> <td>AV Out</td><td>2 NTSC-M RCA (CVBS), S-Video, Component (Y/Pb/Pr) Video, HDMI, 2 RCA, 2 S/PDIF (Optical, Electrical)</td></tr> <tr> <td>AV In</td><td>1 Component (Y/Pb/Pr) Video, 1 RCA (L/R)</td></tr> <tr> <td>Connections-Interactive</td><td>USB 2.0 Host, IEEE 1394, E-SATA, RJ-45 Ethernet (10/100M)</td></tr> <tr> <td>CableCARD</td><td>Multi-Stream CableCARD™</td></tr> <tr> <td>Power</td><td>AC 120V, 60Hz, AC Outlet</td></tr> </tbody> </table> <p>To the extent any differences are alleged to exist between this claim element and the above referenced functionality, such differences are insubstantial. On information and belief, the hardware and software in the Samsung DVRs perform substantially the same function as the Sink Object, for example that of obtaining buffers or pointers thereto and outputting data streams, in substantially the same way, for example by using one or more instantiations of software codes and/or hardware/firmware combinations, to yield the same result, datastreams being output to a decoder.</p>	Feature	Description	RF Input	F-type Female	AV Out	2 NTSC-M RCA (CVBS), S-Video, Component (Y/Pb/Pr) Video, HDMI, 2 RCA, 2 S/PDIF (Optical, Electrical)	AV In	1 Component (Y/Pb/Pr) Video, 1 RCA (L/R)	Connections-Interactive	USB 2.0 Host, IEEE 1394, E-SATA, RJ-45 Ethernet (10/100M)	CableCARD	Multi-Stream CableCARD™	Power	AC 120V, 60Hz, AC Outlet
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CableCARD	Multi-Stream CableCARD™														
Power	AC 120V, 60Hz, AC Outlet														
[61h] wherein said decoder converts said streams into display signals and sends said signals to a display;	<p>A Samsung DVR has a decoder that converts data streams into display signals and sends those signals to a display. <i>See, e.g.</i>, (Broadcom BCM 7400 Product Brief), at 1:</p> <div data-bbox="365 1135 1075 1364"> <p style="text-align: center;"><b>FEATURES</b></p> <ul style="list-style-type: none"> <li>• <b>Dual advanced AVC/MPEG-2/VC-1 decoders</b> <ul style="list-style-type: none"> <li>• H.264/AVC Main and High Profile to Level 4.1</li> <li>• VC-1 Advanced Profile @ Level 3</li> <li>• VC-1 Simple and Main Profile</li> <li>• HD MPEG-2 and SD MPEG-2</li> <li>• MPEG still-picture decode</li> <li>• DivX<sup>®</sup> and MPEG4 part 2 ASP decode</li> </ul> </li> </ul> </div> <p>(Broadcom BCM 7400 Product Brief), at 2 (showing video decoders):</p>														





the Claim	Samsung DVRs <sup>1</sup>
	hardware/firmware combinations, to yield the same result, data and operations executing in the DVR that are self regulated.
<p>[61j] a control object, wherein said control object receives commands from a user, said commands control the flow of the broadcast data through the system; and</p>	<p>A Samsung DVR provides a control object, a collection of data and operations that, among other things, receives user commands, which control the flow of the broadcast data through the system. The Samsung DVR software is responsive to front panel buttons and a remote control. On information and belief, the remote control sends IR signals that are received by the Samsung DVR. The hardware and software receives user commands, which control the flow of data through the system, e.g., begin recording, channel change, trickplay, etc. <i>See, e.g.</i>, (BCM7400 Product Brief) (showing front panel controls input to the BCM7400 chip):</p> <p><a href="http://www.timewarnercable.com/MediaLibrary/1/1/FAQ/Digital%20Cable/Samsung/Samsung_SMT_3090HD_UserGuide.pdf">http://www.timewarnercable.com/MediaLibrary/1/1/FAQ/Digital%20Cable/Samsung/Samsung_SMT_3090HD_UserGuide.pdf</a> (Samsung SMT-H3090 2008 User Guide), at 10:</p>

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[61k] wherein said control object sends flow command events to said source, transform, and	A Samsung DVR provides a control object, a collection of data and operations that, among other things, sends flow command events to source, transform, and sink objects. On information and belief, the remote control sends IR signals that are received by the Samsung DVR. The Samsung DVR software is responsive to front panel buttons and a remote control. The hardware and software receives user commands and sends command events to other portions of the software to control the various functions of the unit, e.g., channel selection, start recording, trickplay, picture-in-picture, etc. <i>See, e.g.</i> , (BCM7400 Product Brief) (showing front panel controls input to the BCM7400 chip):																		

the Claim	Samsung DVRs <sup>1</sup>
sink objects.	 <p>The diagram illustrates the system architecture of the Samsung SMT-3090HD DVR. At the center is the <b>BROADCOM BCM7400 1000 DMIPS Dual HD AVC, VC-1</b> processor. This central unit is connected to various components:</p> <ul style="list-style-type: none"> <li><b>Inputs/Outputs (top):</b> STEREO AUDIO OUT, S/PDIF OUT VIDEO OUT YPbPr OUT, Triple USB 2.0, 10/100 Ethernet, Power, and CABLE IN.</li> <li><b>Left Side Components:</b> <ul style="list-style-type: none"> <li><b>1394 MAC/PHY</b> connected to a <b>BROADCOM BCM7043 AVC/MPEG-2 Transcoder</b>.</li> <li><b>DDR1/DDR2 200 MHz 512 MB X64 + dual x16</b> memory.</li> <li><b>Flash 64Mx8</b> and <b>HDD</b> storage.</li> <li><b>DVD-R/W Drive</b> connected via <b>SATA II</b>.</li> <li><b>IR and UHF I/F</b> (Infrared and Ultra High Frequency interface).</li> </ul> </li> <li><b>Right Side Components:</b> <ul style="list-style-type: none"> <li><b>DDR SDRAM 16 MB</b> memory.</li> <li><b>BROADCOM BCM3255 DOCSIS 2.0+ 500+ DMIPS</b> tuner.</li> <li>Three <b>BROADCOM BCM3420</b> chips.</li> <li><b>OpenCable™ CableCARD™</b> interface.</li> </ul> </li> <li><b>Internal Connections:</b> <ul style="list-style-type: none"> <li><b>TS I/F</b> (Transport Stream interface) connects the transcoder, central processor, and tuner.</li> <li><b>TS In</b> (Transport Stream input) connects the tuner to the central processor.</li> <li><b>10/100 Enet</b> (Ethernet) connects the central processor to the network interface.</li> <li><b>USB 2.0</b> connects the central processor to the USB ports.</li> <li><b>RF Mod</b> (Radio Frequency Modulator) connects the central processor to the RF OUT.</li> <li><b>Comp. Video</b> (Composite Video) connects the central processor to the video outputs.</li> <li><b>NTSC/PAL Video</b> connects the central processor to the video outputs.</li> <li><b>S/PDIF Out</b> connects the central processor to the S/PDIF OUT.</li> <li><b>HDMI/DVI Out</b> connects the central processor to the HDMI/DVI OUT.</li> <li><b>Audio Out</b> connects the central processor to the STEREO AUDIO OUT.</li> </ul> </li> </ul> <p><a href="http://www.timewarnercable.com/MediaLibrary/1/1/FAQ/Digital%20Cable/Samsung/Samsung_SMT_3090HD_UserGuide.pdf">http://www.timewarnercable.com/MediaLibrary/1/1/FAQ/Digital%20Cable/Samsung/Samsung_SMT_3090HD_UserGuide.pdf</a>  (Samsung SMT-H3090 2008 User Guide), at 10:</p>

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